

REMARKS

In the Office Action, the Examiner rejected claims 48-51, 56, 58-61, 66, 68-71, and 76, and withdrew claims 52-55, 57, 62-65, 67, 72-75, and 77 from consideration as drawn to non-elected species. Applicants canceled claims 1-47 in a previous communication. By the present Response, Applicants amend claims 49-51, 58-61, and 69-71 to further clarify the claimed subject matter and cancel claims 52-55, 57, 62-65, 67, 72-75, and 77 without prejudice. Applicants also add new claims 78 and 79; no fees are believed due for these two dependent claims in view of the concurrent cancellation of a greater number of dependent claims. Upon entry of the amendments, claims 48-51, 56, 58-61, 66, 68-71, 76, 78, and 79 will be pending in the present patent application. Applicants respectfully request reconsideration of the above-referenced application in view of the foregoing amendments and the following remarks.

Rejections under 35 U.S.C. § 112

In the Office Action, the Examiner rejected claims 49-51, 59-61, and 69-71 under 35 U.S.C. § 112, second paragraph, alleging insufficient antecedent basis for the recitation of “the at least one connector” in these claims. Additionally, the Examiner also rejected claims 51, 61, and 71 under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the enablement requirement. Although Applicants do not necessarily agree with these rejections, Applicants have amended claims 49-51, 59-61, and 69-71 to clarify the claimed subject matter. It is believed that the bases for these rejections are moot in view of the present amendments. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 49-51, 59-61, and 69-71 under 35 U.S.C. § 112, first and second paragraphs.

Rejections under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 48 and 56 under 35 U.S.C. § 102(b) as anticipated by Bäuml et al. (U.S. Patent No. 5,966,291). As this reference

does not, in fact, disclose each and every element of these claims, Applicants respectfully traverse this rejection.

Legal Precedent

Anticipation under Section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under Section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). Moreover, the prior art reference also must show the identical invention “in as complete detail as contained in the ... claim” to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989) (emphasis added). Accordingly, Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter.

Applicants also respectfully remind the Examiner that, during patent examination, the pending claims must be given an interpretation that is *reasonable* and *consistent* with the specification. See *In re Prater*, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969); see also *In re Morris*, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); see also Manual of Patent Examining Procedure §§ 608.01(o) and 2111. Moreover, any interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. See *In re Cortright*, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); see also Manual of Patent Examining Procedure § 2111.

Omitted Features of Independent Claim 48

Turning now to the present claims, the Bäumel reference fails to disclose each element of independent claim 48. For instance, independent claim 48 generally recites a power converter including a switching circuit, a housing, and “at least one *plug-in* connector coupled to the switching circuit and to the housing for establishing electrical

continuity between the converter and external circuitry” (emphasis added). Because the Bäumel reference fails to disclose such an element, the cited reference cannot anticipate independent claim 48.

The Bäumel et al. reference is directed to an improved power module for the control of electric motors. *See* Bäumel et al., col. 1, lines 61-63. The disclosed apparatus includes semiconductor components, such as IGBT transistors 11 and diodes, of a power unit 1 separately soldered as half bridges (HB1-HB6) onto respective direct copper bonding (DCB) substrates 13. *See id.* at col. 2, line 63 – col. 3, line 4; FIGS. 1 and 2. The substrates 13, in turn, are attached directly to a heat sink 21, which interfaces with a shell 22 to form a cooling unit 2. *See id.* at col. 3, lines 11-19; FIG. 1. Shell 22 includes inlet and outlet openings 221 and 222, respectively, for conduction of a cooling medium 23 through the cooling unit. *See id.* The power unit 1, along with a control unit 3 and other functional units 4, is disposed within a common housing 61. *See id.* at col. 3, line 66 – col. 4, line 2; FIG. 1. Various connecting/conductor bars 52-56 extend from the housing 61. *See id.* at col. 3, line 46 – col. 4, line 2; FIG. 1. Particularly, conductor bars 55 and 56 serve as the inputs to the power unit 1, while connecting bars 52, 53, and 54, which are directly connected to the substrate 13 serve as the outputs from the power unit 1. *See id.* Notably, while the Bäumel et al. reference does disclose that parallel switching of half bridge pairs (i.e., HB1/HB2, HB3/HB4, HB5/HB6) functions as a converter, the cited reference does not teach or even hint at how the connecting bars 52, 53, and 54 of each half bridge cooperate with one another or other conductors to provide output power from the power module to external circuitry.

In sharp contrast, the detailed description of the present application, with respect to various disclosed embodiments, clearly teaches a power converter having a housing and an electrical connector that enables plug-in connections with other circuitry. For instance, the various embodiments illustrated in FIGS. 23-26 include

one or more connection interfaces having conductors 106 and/or 108 surrounded by a peripheral wall or flange, such as flange 234, which extends from the housing and provides EMI shielding to the exposed portions of conductors 106 and/or 108 disposed outside of the housing. *See* Specification, page 32, line 19 – page 34, line 22; FIGS. 23-26. As noted in the specification, this plug-in configuration facilitates simple connection to other circuitry, such as via a mating connector of a ganged-type connector or by plugging the power module into a backplane. *See id.*; *see also id.* at page 38, line 26 – page 39, line 18; FIGS. 32A, 32B, and 33 (describing and illustrating a pluggable power module for use with a backplane, in accordance with certain embodiments).

In the Office Action, the Examiner equated the connecting bars 52, 53, and 54 with the recited “at least one plug-in connector.” More specifically, the Examiner stated that the Bäuml et al. reference discloses “at least one plug-in connector 52/53/54 (col.3:64, considering the connecting bars 52/53/54 for plug in external cables/wires).” *See* Office Action mailed October 10, 2007, page 5. Applicants, however, respectfully note that the single portion of the Bäuml et al. reference that the Examiner cites in support of this comparison merely states that “vertical connecting bars 52, 53, and 54 ... form the outputs R, S, and T of the power module.” *See* Bäuml et al., col. 3, lines 64-65. These connecting bars appear to be nothing more than electrical leads, and the cited reference does not disclose, teach, or even hint that the connecting bars 52, 53, and 54 are “pluggable” in any manner. Further, given that the connecting bars 52, 53, and 54 are connected directly to a copper layer 131 of the DCB substrate 13, and that one skilled in the art would appreciate that copper layers of DCB substrates are typically a thin copper foil having a thickness that is a small fraction of a millimeter (e.g., 300 microns), it appears that any attempt to *plug* the relatively long connecting bars 52, 53, or 54 into external cables or other circuitry would pose a significant risk of damage to the connection of such bars with the thin copper foil of the DCB substrate 13. Consequently, the

connecting bars 52, 53, and 54 cannot be reasonably equated with the recited “plug-in connector” of claim 48. Because it fails to teach each and every element, the Bäumel et al. reference cannot anticipate independent claim 48 or its dependent claims.

For at least these reasons, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 102 and allowance of claims 48 and 56.

Rejections under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 49-50, 58-60, and 66 under 35 U.S.C. § 103(a) as unpatentable over the Bäumel reference. The Examiner also rejected claims 68-70, and 76 under 35 U.S.C. § 103(a) as being unpatentable over Bäumel in view of Nagafuji (U.S. 5,938,450). Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the

obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

Omitted Features of Independent Claim 58

Applicants respectfully submit that the Bäumel et al. reference does not support a *prima facie* case of obviousness with respect to independent claim 58 or its dependent claims. For instance, independent claim 58 recites a modular power converter comprising “at least one *plug-in* connector coupled to the switching circuit and to the housing for ... extending EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector” (emphasis added). In the Office Action, the Examiner equated the connecting bars 52, 53, and 54 with the recited “at least one plug-in connector.” This interpretation, however, cannot be reasonably maintained.

First, as noted above with respect to claim 48, the Bäumel et al. reference fails to disclose or even hint that the connecting bars 52, 53, or 54 may be “plugged” into anything. Indeed, as also noted above, the connection of these bars 52, 53, and 54 to the copper foil layer of a DCB substrate appears to be inconsistent with a pluggable connection to external circuitry via the connecting bars 52, 53, and 54. For at least these reasons, the Bäumel et al. reference does not support a *prima facie* case of obviousness with respect to independent claim 58.

Second, Applicants respectfully note that claim 58 recites that a housing provides integral EMI shielding and the “at least one plug-in connector” extends EMI shielding from the housing to a region at least partially surrounding conductors of the at least one connector. Even assuming, for the sake of argument, that the connecting bars 52, 53, and 54 could be reasonably equated with a plug-in connector, the claim clearly recites that the *plug-in connector* extends EMI shielding to the *conductors*. It is noted that the connecting bars 52, 53, and 54 conduct output power from the power unit 1 and are the only structures identified by the Examiner as equivalent to the “at least one plug-in connector” recited in

claim 58. In essence, the Examiner appears to rely on the connecting bars 52, 53, and 54 as equivalent to *both* the recited conductors and the plug-in connector that extends EMI shielding from the housing to the conductors. As one skilled in the art would not characterize the connecting bars 52, 53, and 54 as extending EMI shielding to the connecting bars themselves, such an interpretation is not reasonable. As such, the Bäümel et al. reference fails to teach the at least one plug-in connector as recited in claim 58, and cannot establish a *prima facie* case with respect to this independent claim or claims 59-61 and 66 depending therefrom.

Omitted Features of Independent Claim 68

Additionally, Applicants respectfully submit that the Office Action does not establish a *prima facie* case of obviousness with respect to independent claim 68 or its dependent claims. For example, independent claim 68 recites a modular power converter comprising “at least one plug-in connector coupled to the switching circuit and to the housing; and a connector plug adapted to interface with the at least one plug-in connector ... wherein the at least one plug-in connector and the connector plug mate to extend EMI shielding from the housing to the connector plug.” Similar to the rejections of claims 48 and 58 previously discussed, the rejection of claim 68 equates the connecting bars 52, 53, and 54 of the Bäümel et al. reference with the recited “at least one plug-in connector coupled to the switching circuit and to the housing.” For the same reasons provided above with respect to the other independent claims of the instant application, however, Applicants respectfully submit that such the connecting bars of the Bäümel et al. reference cannot be reasonably considered as a “plug-in connector.” Consequently, contrary to the Examiner’s assertion, the Bäümel et al. reference does not inherently teach a mating connector plug analogous to that recited in the instant claim. As a result, the Office Action fails to establish a *prima facie* case of obviousness with respect to independent claim 68 or its dependent claims 69-71 and 76.

Deficiencies of the Rejections of Dependent Claims 49, 50, and 56

Applicants further note that each of claims 49, 50, and 56 depends from independent claim 48. As discussed above, the Bäümel et al. reference fails to disclose each element of independent claim 48. Furthermore, the Nagafuji reference fails to obviate the deficiencies of the Bäümel et al. reference with respect to independent claim 48. As a result, dependent claims 49, 50, and 56 are believed allowable on the basis of their dependency from respective allowable independent claims, as well as for the subject matter separately recited in these dependent claims.

For at least these reasons, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103 and allowance of claims 49-51, 58-61, 66, 68-71, and 76.

New Claims

New claims 78 and 79 have been added by this Response. These new claims add no new matter and are fully supported throughout the specification. Furthermore, in view of the concurrent cancellation of a greater number of dependent claims by the present Response, no fees are believed due for the addition of claims 78 and 79 in this Response. These new claims are believed allowable for their dependency from an allowable independent claim, as well as by virtue of the subject matter separately recited by these dependent claims. Accordingly, Applicants respectfully request allowance of dependent claims 78 and 79.

Conclusion

In view of the remarks set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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